CONCEPT MAPPING THE EXPERT KNOWLEDGE OF A UNIVERSITY LECTURER. A CASE-STUDY

Albisu García, Sagrario; González García, Fermín; San Martín Echeverría, Inés; Fiz Poveda, Mª Reyes; Guruceaga Zubillaga, Aranzazu; Pozueta Mendia, Edurne; Tabar Oneca, Mª Jesús; Gómez Laso, Miguel Angel. Universidad Pública de Navarra, Pamplona, Spain
Email: albisu@unavarra.es, fermin@unavarra.es, ines.sanmartin@unavarra.es, reyesfiz@unavarra.es, arantzazu.guruceaga@unavarra.es, edurne.pozueta@unavarra.es, mjesus.tabar@unavarra.es, mangel.gomez@unavarra.es

This paper presents a knowledge model of the good teaching practices of a university lecturer awarded the 2005 Spanish National Award for Educational Research and Innovation in the field of new technology application in university teaching. The model was created within the framework of an investigation being carried out by six Spanish universities. The paper identifies, analyzes, makes explicit and, with the help of CmapTools (Cañas et al, 2004) computer software, represents the pedagogical thinking and teaching practice of a university lecturer with a reputation for good practice. The resulting knowledge model of the good practices of this lecturer is readily accessible via the Internet and provides an excellent guide not only for new lecturers but also experienced lecturers who wish to improve the quality of their teaching.

1   Introduction

The changes currently affecting the University environment are common knowledge. In this context of change, the quality of university teaching is one of the strategic priorities of further education institutions the world over. In our setting, the successive declarations of Prague (2001), Berlin (2003), Bergen (2005), and London (2007) have named it as one of the basic referents of the process of convergence towards a <u>European Space for Higher Education Superior</u> (ESHE).

Improving teaching quality is without doubt a complex process in which numerous factors, ranging from educational policies and available resources to the traditions and cultures of individual countries, etc. play a role. The most decisive role of all, however, is, without doubt, that of teachers and the teacher training process. Some teachers believe there is no reason to change tried and tested methods: in this case, it is essential to revise existing ideas and test them against new approaches. Others believe in the importance of change but do not know how to ensure it is properly carried out: in this case, practical referents are required to enable such teachers to use the practice of their more experienced colleagues as an "example" or "point of reference". In any event, it is absolutely essential to break away from the inertia and close-mindedness that is prevalent in university teaching and "make visible" both the ideas and the practices of "good" university teachers. In this context, a project aimed at increasing the visibility of good teaching practices is being undertaken by several universities (Zabalza, 2004/08), among them the Public University of Navarra. This poster offers an example of one of the lecturers considered to provide a model of good teaching practice and awarded third place in the 2005 Spanish National Awards for Educational Research and Innovation *"Aulario Virtual: un nuevo espacio para la docencia y la armonización europea en la Universidad Pública de Navarra" (The Virtual Classroom: a new space for the harmonization of teaching in Europe).*

2   Methodology

The aim of this research was to identify, analyze and make explicit the pedagogical thinking and practices of University lecturers, from various disciplines, who have been assesses as providing a model of "good practice", and to visualize and contextualize these good practices using concept maps, with the aid of CmapTools (Cañas et al, 2004). The basic methodology can be described as follows:

1. *Prior interviews* with lecturers identified as providing a model of "good practice". Figure 1 shows the concept map created by research team member, Professor Fiz. based on the interview outcome.
2. *Video-taping of class sessions* (in any form: theoretical, practical, seminars, lab. work, tutorials, etc.).
3. *Creation of concept maps using CmapTools* (applied methodology) for each of the lecturers interviewed.
4. *Follow-up interviews* with the lecturers chosen for the study in order to go over the resulting concept maps and select appropriate links. They were also asked to talk through the taped classroom sessions and select whatever sequences they thought best illustrated their ideas.
5. The teaching materials chosen by the lecturers were digitalized and linked to the matching concepts on the maps, to provide us with a dynamic representation of the conceptual framework of each lecturer and enable us to link it to specific sequences from his teaching.
6. The work carried out by/with each lecturer was put on to a DVD to serve as database where university

teaching staff could find "examples" and "documentation" relating to various different courses and disciplines.

3   Discussion and results

The concept map in Figure 1 was based on the interview with the lecturer in question. The lecturer's biographical details, teaching and research experience and general views and opinions of conditions at the university can be found by clicking on the corresponding icons. Two extra concepts can be accessed by clicking on the corresponding icon, one is the interview transcript and the other the remarks of the lecturer performing the research.
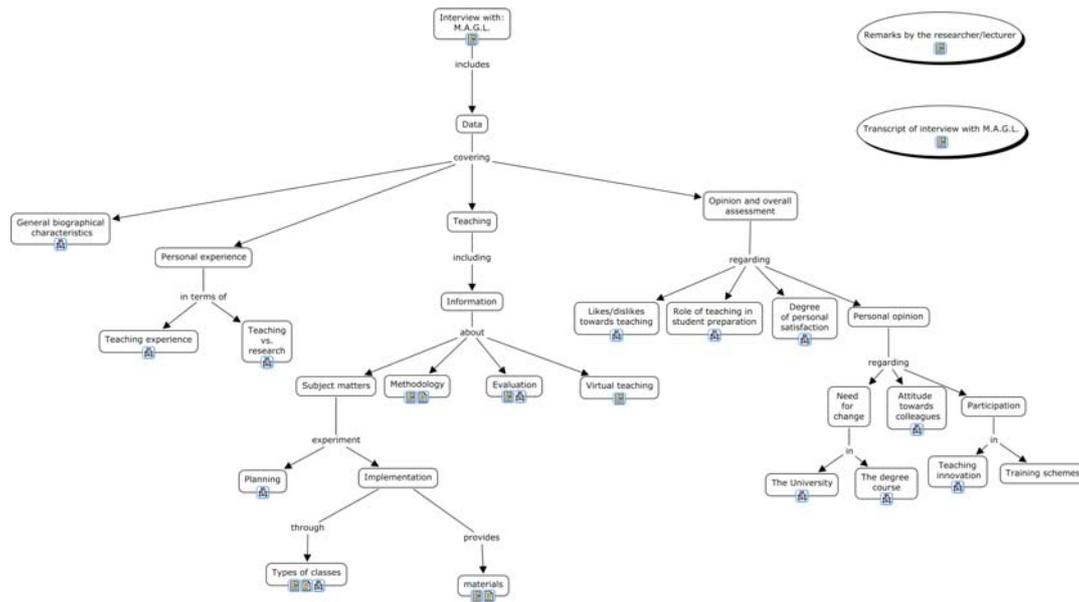

Figure 1. Concept map of the knowledge elicited from the "good practice" lecturer

Figure 2, which appears after clicking on the icon linked to "Planning" in Figure 1 shows a concept map of the subject planning made by the lecturer in question. The subject in this case is *Fibre Optic Networks (which is taught almost entirely in English),* and represents 4 ECTS (or 6 LRU credits) for the fifth year of the degree course in Telecommunications Engineering. The map shows the subject planning with several of the links from the related concepts left open. There is also a concept relating to the remarks on the subject planning made by the lecturer conducting the research. These can also be accessed by clicking on the corresponding icon.
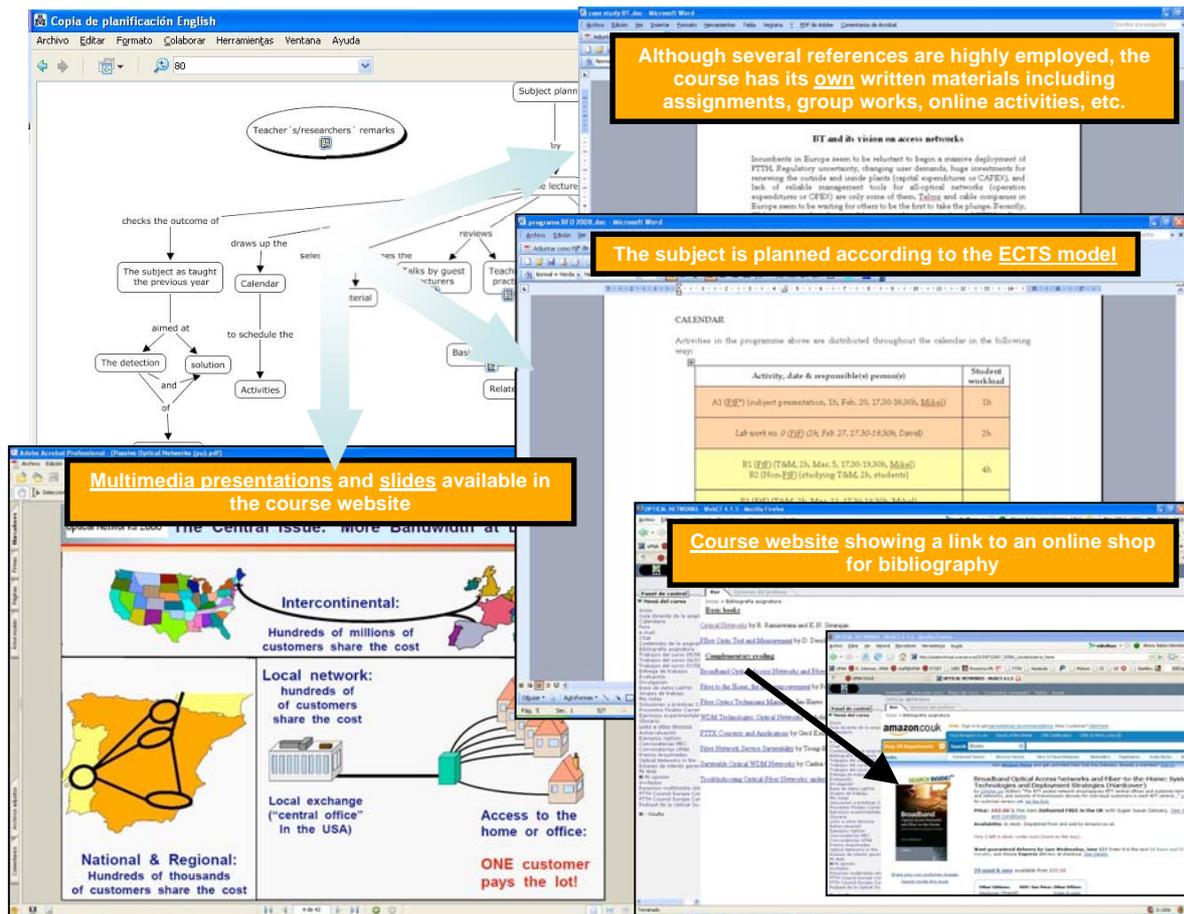
Figure 2 Concept map showing the subject planning with some of the links open.

Finally, figure 3 shows a concept map giving a detailed description of the organization of a lesson. It is easy to appreciate the good balance between theory and practice that has been achieved in this subject, together with the use of a varied methodology, intelligently designed to motivate students and maintain their pace of activity. It is also worth pointing out the use of new technologies in the form of computer simulations and animations. Continuous interaction among the students and between students and the lecturer was made possible by the elearning platform. Of particular interest from the point of view of teaching strategy is the habit of reviewing the content of the previous lesson in order to anticipate that of the next. The students' presentations enable us to visualize the way in which they transform information into useful knowledge. Note also the icons associated with the various concepts; these provide links with different resources and explanations.
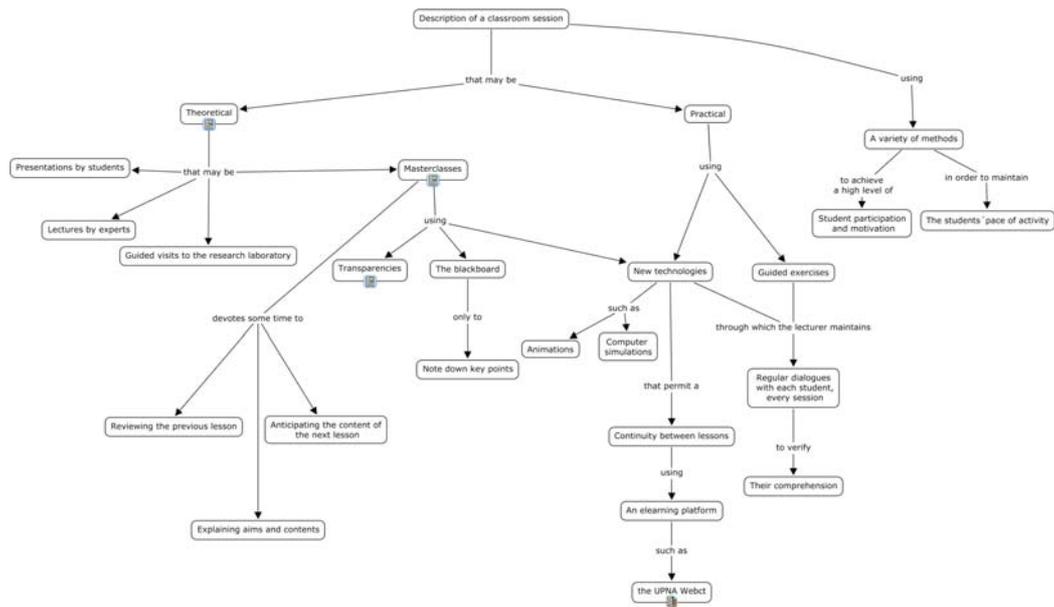
Description of a classroom session

that may be

Theoretical

Practical

using

A variety of methods

that may be

Presentations by students

Masterclasses

to achieve a high level of

in order to maintain

Student participation and motivation

The students´ pace of activity

Lectures by experts

Guided visits to the research laboratory

using

Transparencies

The blackboard

New technologies

Guided exercises

devotes some time to

only to

such as

through which the lecturer maintains

Note down key points

Animations

Computer simulations

Regular dialogues with each student, every session

that permit a

Reviewing the previous lesson

Anticipating the content of the next lesson

Continuity between lessons

to verify

Their comprehension

using

Explaining aims and contents

An elearning platform

such as

the UPNA Webct

Figure 3 Concept map showing the elements involved in a classroom session

4   Conclusions

In the light of the data obtained, though with all due caution, it can be said that

- ✓ The maps effectively and efficiently reflect the lecturers' knowledge and the way they teach their subjects, as illustrated by the various concept maps constructed from the information provided by the lecturers. The maps have made their good practices visible.
- ✓ The iterative process of negotiating and sharing meanings in the various maps constructed in collaboration between the researching lecturer and the "good practice" lecturer has set up a constant flow of feedback leading to a clarification of the experts' own stock of knowledge.
- ✓ The CmapTools software has proved to be a powerful tool not only for designing the interview and managing the data but also for eliciting and then representing the knowledge.

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